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Asthma diagnosed in late adulthood is linked to work disability and poor employment status

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Abstract

Background

Age at asthma onset is associated with severity and outcomes of the disease.

Objective

We studied if age at asthma diagnosis is related to employment and outcomes in working career.

Patients and methods

A questionnaire was sent to 2613 adults with asthma in Tampere, Finland, and a follow-up questionnaire was sent after six years. Asthmatics were divided into groups based on their employment status: working full-time or work disability. Logistic regression was used to study the association of age at asthma diagnosis with employment status at baseline and with the risk of exiting full-time work during follow-up period.

Results

In cross-sectional analysis, asthma diagnosed in late adulthood (50+ years) was associated with higher OR for having work-disability compared to childhood onset asthma (OR [95 % CI] 3.60 [1.43-9.06]). During follow-up, asthma diagnosed in late adulthood was associated with higher OR for exiting full time work compared to childhood-onset asthma (OR 10.87 [3.25-36.40]).

Conclusions

Asthma diagnosed in late adulthood is a higher risk for poor employment than asthma diagnosed earlier in life. Adult-onset of asthma is an important factor in view of work ability and early rehabilitation procedures.

Introduction

Age of onset of asthma seems to differentiate phenotypes of asthma [1, 2]. Asthma with onset later in life is often non-allergic, related to life style and environmental factors, more severe, and has generally a poorer prognosis [1-3]. Majority of new asthma diagnoses are made in adults [4, 5]. Adult-onset asthma is associated with negative effects on working career [6, 7], but previous studies have not compared whether asthma onset in early or late adulthood has different impacts on working career.

The aim of this study was to assess if asthma onset age affects work ability and employment status. We studied the association between asthma onset age and employment status in a cross-sectional setting and the relation between age at asthma diagnosis and risk for exiting full-time work during a follow-up period of six years

in a longitudinal setting.

Patients and methods

This longitudinal questionnaire-based survey was conducted at years 2000 and 2006. The target population was adults with special reimbursement right for asthma medication (n=2613) aged 20–65 years and living in the city of Tampere, Finland [8]. We included 1274 subjects with asthma to a cross-sectional analysis in 2000 who were working full-time (n=954) or had work disability (n=320). The follow-up questionnaire was sent in 2006 and out of the 954 full-time workers in 2000, 650 (68%) responded in 2006. Exit from work during follow-up (180 out of 650 subjects) was defined as working full time at year 2000 but ceasing to work full time anymore by 2006.

Statistical analyses

Logistic regression models were built using work disability vs. full-time work as an outcome variable. Categorized age at asthma diagnosis was used as an independent variable. Models were adjusted with background variables (gender and smoking) and estimated separately in different age groups (to control for the relation between current age and age at asthma diagnosis). In the longitudinal part of the study the outcome variable was exiting full-time work vs. staying at full-time work. All analyses were carried out using SPSS (version 24) software (IBM Corporation, New York).

Results

Table 1.Odds ratios (OR) with 95% confidence intervals (CI) for having work disability (vs. full-time work) at year 2000 according to onset age of asthma and for exit from full-time work during follow-up 2000-2006 (vs. staying at full-time work). Background variables used for adjustment included gender and smoking status.

	Work disability vs. full-time work at year 2000		Exit from full-time work vs. staying at full-time work, follow-up 2000-2006	
	Crude model	Adjusted model	Crude model	Adjusted model
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
All age groups				
Age (years) at asthma diagnosis (vs. 0-17)				
18-29	1.85 (1.08-3.18)	1.89 (1.10-3.25)	1.42 (0.79-2.55)	1.32 (0.73-2.40)
30-39	4.34 (2.60-7.24)	4.24 (2.53-7.13)	2.81 (1.58-5.00)	2.59 (1.45-4.63)
40-49	7.47 (4.54-12.31)	7.55 (4.55-12.55)	4.92 (2.77-8.74)	4.38 (2.43-7.87)
50-	21.07 (11.93-37.19)	20.82 (11.6-37.08)	20.03 (8.03-50.0)	18.01 (7.15-45.37)
Age group 50+				

Age (years) at asthma diagnosis (vs. 0-17)				
18-29	1.12 (0.43-2.88)	1.12 (0.43-2.91)	1.38 (0.49-3.91)	1.35 (0.47-3.85)
30-39	1.58 (0.64-3.88)	1.56 (0.63-3.87)	1.97 (0.73-5.27)	1.90 (0.71-5.12)
40-49	1.57 (0.65-3.79)	1.58 (0.65-3.83)	2.82 (1.07-7.44)	2.65 (1.00-7.03)
50-	3.73 (1.49-9.33)	3.60 (1.43-9.06)	11.46 (3.44-38.18)	10.87 (3.25-36.40)

In the entire study population, adult-onset asthma increased the risk for work disability: the later in life the diagnosis of asthma, the greater the OR for work disability (Table 1). However, current age is related to both risk of work disability and to age at asthma diagnosis. Because asthma diagnosis age and current age are correlated, age could not be used as an explanatory variable in the logistic regression but instead we calculated the OR for work disability separately in different age groups (18-29, 30-39, 40-49, 50+ years). In younger age groups, age at asthma diagnosis was not related to risk of work disability, but in age group 50+ where the prevalence of work disability is higher, the odds ratio for work disability was 3.6 (1.4 – 9.1) in those with asthma diagnosis at age 50 years or more compared to those with asthma diagnosed in childhood.

In the follow-up (2000-2006), the association between age at asthma diagnosis and risk for exiting full-time work diminished in younger age groups, and was therefore probably explained by age, but again in the age group of 50+ years, the odds ratio for exiting full-time work was 10.9 (95 % CI 3.3 – 36.4) among those with asthma diagnosed in late adulthood (50+ years) compared to childhood.

Discussion

We have shown in a cross-sectional setting that asthma diagnosed in late adulthood increases the risk for work disability more often than asthma diagnosed in childhood. During a follow-up of six years asthma diagnosed in late adulthood was associated with higher risk for drifting out from full-time work compared to asthma diagnosed in childhood.

Although work ability and employment status of asthma patients have been studied widely [9-12] and onset age and different phenotypes of asthma have been of interest of researchers recently [1], the evidence on the association of asthma onset age and work ability or employment status is still lacking.

The difference in coping in working life between childhood-onset and late-onset asthma may be related to at least three factors. First, childhood onset asthma is more often mild and sensitive to treatment with ICS [1, 13]. Second, if asthma starts early in life it may be that growing up with asthma makes it easier to cope with asthma later in working life through adaptation over years. Third, among adults with late adult-onset asthma, the proportion of work-related asthma increases and staying at jobs with harmful exposures may aggravate symptoms and complicate diagnostics and treatment [14, 15].

The strengths of our study are the large study population well representing Finnish asthmatics whose disease has been verified by lung function measurements and the longitudinal follow-up study design. However, as in all questionnaire-based studies, selection bias is possible and we do not know whether those who answered this questionnaire have e.g. more severe asthma or vice versa. Also subjects with mild asthma and no regular treatment do not get special reimbursement for their medication and are therefore not presented by the current study. Our material was collected in years 2000 and 2006 and some aspects in asthma treatment or working life may have changed, but we consider the results still valid [16].

In the present study we asked the subjects the age they were when asthma was diagnosed and not the age they actually noticed first asthma-like symptoms (onset of asthma). Age at asthma diagnosis may be considerably later than onset of asthma due to many reasons. Although our results strictly reflect only the association between age at asthma diagnosis and outcomes in working life, they may be considered to reflect also the effects of asthma onset age on working career.

Conclusions

We have found evidence that asthma diagnosed in late adulthood is associated with poorer coping in working life and unfavorable employment status compared to those whose asthma has been diagnosed in childhood. The later in life the diagnosis of asthma, the greater the risk of drifting away from full-time work. Whether this difference between late onset and childhood onset asthma is related to differences in endotypes of asthma or to differences in adapting to live with asthma needs to be further studied. Our results highlight the significance of adult-onset asthma among workforce and occupational health units have an important role in identifying and guiding adults with asthma, to prevent early exit from work.

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